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| 10/628,594      | 07/28/2003  | Robert C. Sundahl    | 884.264US2          | 4636             |

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EXAMINER

NGUYEN, DONGHAI D

ART UNIT PAPER NUMBER

3729

DATE MAILED: 12/14/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

10/628,594

Applicant(s)

SUNDAHL ET AL.

Examiner

Donghai D. Nguyen

Art Unit

3729

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 28 July 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-22 is/are pending in the application.
- 4a) Of the above claim(s) 14-22 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-13 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date 7/28/03.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

**DETAILED ACTION**

***Election/Restrictions***

1. Restriction to one of the following inventions is required under 35 U.S.C. 121:
  - I. Claims 1-13, drawn to a method for manufacturing an interconnected circuit board assembly, classified in class 29, subclass 832.
  - II. Claims 14-22, drawn to other method for manufacturing an interconnected circuit board assembly and an electronic system, classified in class 29, subclass 841.

The inventions are distinct, each from the other because of the following reasons:

2. Inventions Group I and Group II are related as mutually exclusive species in an intermediate-final product relationship. Distinctness is proven for claims in this relationship if the intermediate product is useful to make other than the final product (MPEP § 806.04(b), 3rd paragraph), and the species are patentably distinct (MPEP § 806.04(h)). In the instant case, the intermediate product is deemed to be useful as a different final product, such as semiconductor assembly without glass substrate and/or optoelectrical display elements and the inventions are deemed patentably distinct since there is nothing on this record to show them to be obvious variants. Should applicant traverse on the ground that the species are not patentably distinct, applicant should submit evidence or identify such evidence now of record showing the species to be obvious variants or clearly admit on the record that this is the case. In either instance, if the examiner finds one of the inventions anticipated by the prior art, the evidence or admission may be used in a rejection under 35 U.S.C. 103(a) of the other invention.

Art Unit: 3729

3. Because these inventions are distinct for the reasons given above and have acquired a separate status in the art as shown by their different classification, and the search required for Group II is not required for Group I, restriction for examination purposes as indicated is proper.

4. During a telephone conversation with Sherry Schumm on December 7, 2004 a provisional election was made with traverse to prosecute the invention of Group I, claims 1-13. Affirmation of this election must be made by applicant in replying to this Office action. Claims 14-22 are withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention.

5. Applicant is reminded that upon the cancellation of claims to a non-elected invention, the inventorship must be amended in compliance with 37 CFR 1.48(b) if one or more of the currently named inventors is no longer an inventor of at least one claim remaining in the application. Any amendment of inventorship must be accompanied by a request under 37 CFR 1.48(b) and by the fee required under 37 CFR 1.17(i).

The Examination of Claims 1-13 as follow:

***Claim Rejections – 35 USC § 102***

6. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) The invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

7. Claims 1, 4-9 are rejected under 35 U.S.C. 102(b) as being anticipated by US Patent No. 5,551,627 to Leicht et al.

Regarding claims 1 and 4, Leicht et al disclose a method for manufacturing an interconnected circuit board assembly, the method comprising: placing one or more spacers (solder 210) on one or more first bond pads (202) of a first circuit board (206), wherein the one or more spacers are formed of a conductive material that remains in a solid form during attachment of the first circuit board to a second circuit board (Col. 5, lines 9-12); aligning the first circuit board with the second circuit board (208) so that one or more second bond pads (204) of the second circuit board align with the one or more first bond pads (Fig. 1), and the one or more second bond pads make electrical contact with the one or more spacers; and attaching the first circuit board to the second circuit board (Fig. 5).

Regarding claim 5, see Col. 5, lines 36-38.

Regarding claims 6-9, Leicht et al disclose the step of applying a conductive paste (solder 212) in contact with each of the one or more spacers and heating the conductive (Col. 5, lines 41-43).

8. Claims 1 and 10-13 are rejected under 35 U.S.C. 102(b) as being anticipated by US Patent No. 5,795,818 to Marrs.

Regarding claim 1, Marrs discloses a method for manufacturing an interconnected circuit board assembly, the method comprising: placing one or more spacers (312) on one or more first bond pads (502) of a first circuit board (501), wherein the one or more spacers are formed of a conductive material (Cu, Al, etc.) that remains in a solid form during attachment of the first circuit board to a second circuit board (Figs. 7-8); aligning the first circuit board with the second circuit board (201) so that one or more second bond pads (204) of the second circuit board align

Art Unit: 3729

with the one or more first bond pads (Col. 5, line 54), and the one or more second bond pads make electrical contact with the one or more spacers; and attaching the first circuit board to the second circuit board (Fig. 7).

Regarding claims 10-11, Marrs discloses the inserting an insulating material (901) in an interface region between the first circuit board and the second circuit board (Fig. 8) by injecting the insulating material into the interface region (Col. 10, lines 47-65).

Regarding claims 12-13, Marrs discloses the insulating material (199 and/or 601) to circuit board (201/501) prior to attaching the first circuit board to the second circuit board and curing the insulating material (Fig. 7-8).

### ***Claim Rejections - 35 USC § 103***

9. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

10. Claims 2 and 3 are rejected under 35 U.S.C. 103(a) as being unpatentable over Leicht et al

Regarding process of forming spacer by electroplating and welding the spacers to the bonding pads. It would have been an obvious matter of design choice to choose any methods to form the spacers using selective electroplating process and attaching the spacers to the bonding pads by welding, since Applicants has not disclose that the process of forming the spacers using selective electroplating process and attaching the spacer to the bonding pads by welding is

Art Unit: 3729

critical and patentable procedure that solves any stated problem or is for any particular purpose and it seems the invention would perform equally well with the known and available techniques shown in Fig. 2 of Leicht et al.

### *Conclusion*


11. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

12. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Donghai D. Nguyen whose telephone number is (571)-272-4566. The examiner can normally be reached on Monday-Friday (9:00-6:00).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Peter D. Vo can be reached on (571)-272-4690. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

DN

 12/08/04  
MINH TRINH  
PRIMARY EXAMINER